Drivers, binge drinking, and gammaglutamyltranspeptidase

In 1976 the Blennerhassett Committee recommended the identification of high-risk individuals among convicted drunk drivers.¹ In the near future the Department of Transport, under Section 87 of the Road Traffic Act 1972, may define high-risk offenders as drivers who are convicted of drinking and driving on two occasions within 10 years or who have blood alcohol concentrations above 200 mg/100 ml (43.4 mmol/l). The driver would then be investigated by the medical advisers of the Department of Transport for evidence of dependence on alcohol or a drink problem. An alternative method of identification may include biochemical indicators of problem drinking.

The enzyme γ -glutamyltranspeptidase is generally acknowledged as a sensitive indicator of excessive alcohol consumption² and has been used in two studies of drivers.^{3,4} The activity of the enzyme measured at the time of arrest may therefore be a simple way accurately to identify many high-risk individuals with potential or actual drinking problems. One prerequisite to operational use as a screening test is a demonstration that the activity of the enzyme is not raised by one drinking bout immediately preceding arrest.

Subjects, methods, and results

To simulate the "Saturday-night drinking driver" we invited 54 healthy drivers (53 men and one woman) aged 18-51 years (mean 33.3) to drink wines, spirits, and beers freely over five hours. Before drinking a baseline blood sample was taken; a second sample was taken one and a half hours after the end of the drinking session and a third eight hours after the session. γ -Glutamyltranspeptidase activity was measured in all three samples and blood alcohol concentration in the second and third samples. The results, with the subjects subdivided by the amount of alcohol ingested, are shown in the table.

Total amount of alcohol ingested, blood alcohol concentration, and γ -glutamyltranspeptidase activity (mean values expressed $\pm$ SD)

Alcohol ingested (g)	No of subjects	Mean blood alcohol (mg/100 ml)*		Mean γ -glutamyltranspeptidase (IU/l)		
		After 6½ hours	After 13 hours	At start	After 6½ hours	After 13 hours
Nil	1	0	0	19	21	20
51-100	4	46 ± 49	10 ± 21	35 ± 21	31 ± 18	35 ± 21
101-150	6	111 ± 66	25 ± 45	50 ± 57	48 ± 57	48 ± 53
151-200	12	140 ± 32	14 ± 15	25 ± 9	22 ± 9	24 ± 10
201-250	9	162 ± 72	43 ± 47	39 ± 27	36 ± 27	40 ± 29
251-300	10	195 ± 60	56 ± 43	39 ± 42	37 ± 41	37 ± 38
301-400	10	238 ± 40	108 ± 58	39 ± 29	37 ± 30	38 ± 28
401-500	2	275 ± 4	115 ± 13	59 ± 35	57 ± 42	58 ± 35

*1 mg/100 ml = 0.217 mmol/l.

Forty-five subjects had peak blood alcohol concentrations above the legal limit for driving (80 mg/100 ml; 17.4 mmol/l) one and a half hours after the drinking session, corresponding to an alcohol ingestion of greater than 100 g; 14 drivers were still above the legal limit eight hours after drinking, and in these cases alcohol ingestion was greater than 300 g. No significant differences in γ -glutamyltranspeptidase activities were observed in nine subjects with abnormal values (> 50 IU/l). By two-way analysis of variance the significant variation between times of testing indicated a difference in the mean γ -glutamyltranspeptidase activities on the three occasions, the mean activities being 37.3, 34.9, and 36.5 IU/l, respectively (SE of difference between two means = 0.54). The mean at one and a half hours was about 5% lower than that at baseline and at eight hours after ingestion ($p < 0.01$). This was fairly small compared with typical interindividual variations, which are of the order of ± 30 units. Biochemically these differences were not important and may have been a reflection of haemodilution by alcohol; no differences were, however, observed for subjects consuming different amounts of alcohol. Neither overall mean γ -glutamyltranspeptidase activities nor variation in values over time depended on the amount of alcohol ingested.

Comment

Our study suggests that one drinking bout is insufficient to cause a noticeable alteration in γ -glutamyltranspeptidase activity within the eight hours during which most drivers are likely to be charged with driving offences concerning blood alcohol concentrations exceeding the legal limit. The results do not agree with a study⁵ which claimed that serum γ -glutamyltranspeptidase activity was raised 15-60 hours

after ingestion. Only nine subjects were studied and formal statistical assessment of the changes was not undertaken. As raised γ -glutamyltranspeptidase activity in the absence of alternative causal factors generally indicates problem drinking of some chronicity, it may have a place in identifying high-risk individuals among drunk drivers and could be measured at the time of arrest.

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Departments of Community and Occupational Medicine and Department of Biochemical Medicine, Ninewells Hospital and Medical School, Dundee DD1 9SY

J A DUNBAR, MRCP, DMJ, co-ordinator

J HAGART, MSc, psychologist

B MARTIN, BSc, PhD, clinical biochemist

S OGSTON, MA, MSc, medical statistician

M S DEVGUN, PhD, MIBIOL, clinical biochemist

Reversible gynaecomastia associated with D-penicillamine in a man with rheumatoid arthritis

D-Penicillamine treatment is associated with a wide variety of side effects, some of which more commonly occur in patients with rheumatoid arthritis.¹ Breast gigantism has been reported in six women after treatment with penicillamine, five of whom suffered from rheumatoid arthritis. We report a case of gynaecomastia in a man with rheumatoid arthritis who was receiving penicillamine.

Case report

A 30-year-old man developed symmetrical progressive inflammatory polyarthritis over two years with increasing morning stiffness, joint pain, and swelling. His general health was good and there was no relevant past or family history. He had one son. General examination showed no other abnormality and he had no extra-articular features of rheumatoid arthritis. Haemoglobin concentration was 14.7 g/dl, erythrocyte sedimentation rate was 16 mm in the first hour, and rheumatoid factor was present in a titre of 1/1024. Radiography showed erosive changes in knees and feet. Full doses of non-steroidal anti-inflammatory drugs failed to alleviate his symptoms, and penicillamine was started. The dose was increased to 625 mg daily without clinical evidence of remission.

Seven months after starting penicillamine he noticed unilateral gynaecomastia that was not associated with any changes in libido, potency, or distribution or growth of hair. Examination showed tender, firm breast enlargement on the left side with no lymphadenopathy. Male secondary sex characteristics were normal and the testes were of normal size and consistency. Full blood count, erythrocyte sedimentation rate, and thyroid and liver function values were normal, as were serum iron and total iron-binding capacity. Complement C3, C4, and CH₅₀ values were within normal limits, and there was no evidence of cryoprecipitable circulating immune complexes. Concentration of plasma thyroid-stimulating hormone was 2.5 mU/l (normal up to 5.7), prolactin 188 mU/l (60-380), testosterone 19.9 nmol/l (5.7 ng/100 ml) (10-30 nmol/l; 2.8-8.6 ng/100 ml), and oestradiol 83 μ mol/l (2.3 mg/100 ml) (up to 150 μ mol/l; 4.1 mg/100 ml). Basal concentrations of luteinising hormone and follicle-stimulating hormone were 3.0 U/l (1.5-9.0) and 5.7 U/l (1.5-9.0), respectively, and each responded adequately to 50 μ g luteinising hormone and follicle-stimulating hormone releasing hormone. Skull and chest radiographs were normal.

There was no history of taking other drugs known to cause gynaecomastia. Despite the lack of other penicillamine-related side effects, the drug was discontinued. Two months later the gynaecomastia receded, and over the next two years his breasts remained normal.

Comment

Our patient developed gynaecomastia, which is not a recognised extra-articular feature of rheumatoid arthritis, while receiving penicillamine, and this receded after the drug was discontinued. Although the problem had not been described or reported to the manufacturers, the occasional association with breast gigantism²⁻⁵ in women suggests that gynaecomastia may be a rare adverse side effect of treatment. The Committee on Safety of Medicines have a single report of gynaecomastia in a 56-year-old man with rheumatoid arthritis who had received penicillamine for seven days with several other drugs not known to be associated with this complication. His unilateral gynaecomastia regressed after stopping all drug treatment; and, interestingly, he had previously developed gynaecomastia in response to cimetidine.

Gynaecomastia usually results from an alteration in the ratio of circulating unbound testosterone to oestrogens. More rarely changes in the concentration of sex-hormone-binding globulin or prolactin may be implicated and changes in sensitivity of the target organ may occur. No endocrine abnormalities were found in our patient but we did not measure sex-hormone binding globulin, diurnal plasma concentrations of sex hormones, or hormone excretion rates.

The gynaecomastia disappeared after withdrawal of penicillamine, and this differs from the course observed in those patients reported with breast gigantism.²⁻⁵ Indeed, mastectomy and prosthetic surgery were necessary in one case² and danazol in another.⁵ Whatever the pathogenesis of the breast enlargement, potential reversibility may depend on the duration of the inciting stimulus.

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Rheumatic Diseases Unit, Northern General Hospital, and University Department of Medicine, Western General Hospital, Edinburgh EH4 2XU

D M REID, MB, MRCP, lecturer

A G MARTYNOGA, MB, MRCP, senior registrar

G NUKI, MB, FRCP, professor

Spontaneous expulsion of a large colonic tumour

Examination of the faeces of a patient with abdominal symptoms, though useful, is often neglected because it is unaesthetic. In the following case what was found in the bedpan provided the diagnosis, which could not otherwise have been made.

Case report

A previously fit 43-year-old man presented with a four-day history of colicky lower abdominal pain and blood staining of a formed stool for two days. He had had a haemorrhoidectomy 15 years earlier with no recurrence of symptoms. Examination showed tenderness in the left iliac fossa and blood in the rectum, but no lesion on sigmoidoscopy. The symptoms settled promptly, but five days later he was admitted to hospital with severe central

epigastric pain and tenderness, vomiting, and a low-grade fever. Twelve hours later he passed a formed but bloodstained motion, which on inspection also contained a tumour 7×5×5 cm and weighing 54 g. An urgent barium-enema film (figure) was interpreted as showing a carcinoma of the transverse colon which had perforated through the bowel wall.

Barium-enema film interpreted as showing perforated carcinoma of transverse colon.

At laparotomy a localised abscess was found adjacent to the perforated lesion; an extended right hemicolectomy was performed with ileocolic anastomosis. Histological examination showed the tumour to be a necrotic submucous lipoma of the colon, a non-malignant lesion. No evidence of malignancy was found in the resected specimen, and the patient made an uneventful recovery.

Comment

The lipoma had presumably arisen from the transverse colon, produced an intussusception, and had been passed in the faeces. Finding a lipoma made us consider conservative treatment, but the subsequent barium enema showed perforation of the transverse colon with a peritoneal abscess, confirmed at laparotomy. Submucous lipoma of the intestine, an unusual benign tumour, may present as intussusception, intestinal obstruction, rectal bleeding, or anaemia¹ but most often remains undiagnosed or is discovered as an incidental finding.² Some 65% of such tumours arise from the colon, especially the proximal colon.¹ Mayo *et al*¹ reported 164 cases treated surgically over 27 years, 47 of which were associated with carcinoma of the colon. Rectal lipoma has been known to prolapse through the anus,³ and the disappearance of symptoms in cases of obscure intestinal obstruction may sometimes be due to expulsion of a lipoma⁴; however, we can find no previous report of passage of such a tumour per rectum with intestinal perforation. The cause of the perforation would have remained obscure in this case, which illustrates vividly the value of stool examination in patients with gastrointestinal symptoms.

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Department of Medicine, Selly Oak Hospital, Birmingham B29 6JD

D A F ROBERTSON, MB, MRCP, registrar in gastroenterology

W SAWEIRS, MB, MRCP, senior registrar in gastroenterology

T S LOW-BEER, BM, FRCP, consultant physician and gastroenterologist